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Conditional Cash Transfers And Health Of Low-Income Families In The US: Evaluating The Family Rewards Experiment

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Abstract. This paper examines the health impact of Opportunity NYC-Family Rewards, the first conditional cash transfer randomized-controlled trial for low-income families in the United States. Family Rewards offered cash transfers to 2,377 families that were conditional upon their investments in education, preventive health care, and parental employment; and compared their health to a control group of 2,372 families. The program operated between 2007 and 2010 in New York City. It led to a modest improvement in health insurance coverage and a large increase in preventive dental care. It improved parents' perception of their own health and levels of hope (a measure associated with positive mental health), mainly through improvements in reported financial wellbeing. While impacts on physical health are weaker, our study may not have captured effects on chronic disease risk or management that may take longer to accrue.

Introduction

Conditional Cash Transfers (CCTs) have become widespread in low- and middle-income countries over the last 15 years (1). CCTs provide cash benefits to families on the condition that they engage in activities that generate long-term benefits, such as using preventive care services or attending school regularly (1). These programs pursue two simultaneous objectives: to reduce immediate financial hardship, and to promote parental investment in both their own and their children's wellbeing. The overarching idea is that such incentives will break the intergenerational cycle of poverty and generate individual as well as societal benefits (1).

In 2007, the Center for Economic Opportunity of the New York City Mayor's Office initiated the first CCT in the United States (US), Opportunity NYC-Family Rewards ('Family Rewards' hereafter). The program was explicitly modelled after Mexico's Oportunidades (2). It was privately funded (3) and offered to low-income families in six of New York City's most deprived communities. It operated for three years and provided cash rewards in the areas of children's education, preventive health care and employment (4).

There are two main mechanisms through which Family Rewards might improve the health of poor families. First, through its

health-related incentives, it encourages participating families to increase the use of preventive care services. The expectation is that such increases would translate into better health outcomes. Second, the increase in family income brought by the cash transfer might increase the ability to invest in healthy lifestyles and reduce financial stress, both risk factors for poor physical and mental health (5).

Robust evaluations of CCTs in low- and middle-income countries suggest that they hold promise as tools for improving population health (6). Oportunidades and similar interventions across Latin America led to large increases in health services use, including the number of visits to health facilities, receipt of prenatal care and pediatric examinations (7-9). Evidence shows that CCTs also improved some distal health outcomes, in particular developmental, nutritional and cognitive measures among children (10, 11).

In this paper, we examine the impact of Family Rewards on the health of low-income families. We synthesize findings from and extend upon previous reports on this program (4, 12, 13) by examining effects on both proximal health care use outcomes directly incentivized by the program and distal health outcomes. We also explore some of the mechanisms through which Family Rewards may have impacted the health of participating families.

The Family Rewards experiment: design and previous findings

The program was conceived by the Center for Economic Opportunity at the Mayor's Office, in partnership with MDRC (a nonprofit social policy evaluation organization), and Seedco (a workforce and economic development organization)(14).

Three key adaptations were necessary to tailor the program to an urban high-income setting (2). Family Rewards was designed to complement existing government programs such as the Earned Income Tax Credit (EITC) or the Temporary Assistance for Needy Families (TANF). Payments were made conditional on meeting a larger number of specific targets (22 potential rewards *vs.* 6 in Oportunidades). The aim was to link the reward more proximately to specific behaviors (4). Unlike its predecessors, Family Rewards offered rewards in the domain of parental employment in addition to children's education and family preventive health care use.

Family Rewards offered cash rewards for 22 activities in its three core areas (see **Appendix Exhibit 1**) (15). Multiple rewards were offered in each domain, with the hope that the net effect would provide a significant boost in household income. For a three-year period, participating families were

eligible to receive the cash transfers every two months. All behaviors were verified by Seedco using administrative data or coupons submitted by families. Seedco also oversaw the payment system. No limits or conditions were imposed on how families decided to spend the rewards. Family Rewards received ethical approval from the MDRC Institutional Review Board.

Health-related conditions included continuous health insurance coverage, preventive health care checkups and dental care. Incentives for obtaining and sustaining health insurance were available to those families that were eligible for publicly provided health insurance through Medicaid (including the Children's Health Insurance Program and Family Health Plus) or through their employers (4). Rewards were designed to encourage families to get comprehensive preventive care and use private or community health services (rather than the emergency services) for routine care.

The program was evaluated using a randomized controlled trial design: 4,749 families recruited at baseline were randomly allocated to receiving Family Rewards incentives (treated group, *N*=2,377) or to a control group that was not offered incentives (*N*=2,372). The sample was recruited between July 2007 and January 2008 and the program operated for three years (**Appendix Exhibit 2**) (16). Eligibility was based on a combination of family income (at or below 130% of the federal

poverty level), entering grade of the child in September 2007 (4th, 7th and 9th grade), home location (six community districts in the Bronx, Brooklyn and Manhattan) and citizenship status (citizen or legal resident at the time of enrolment).

Family Rewards distributed a total of $20.6 million in cash transfers to participating families (13). Roughly 98% of families received cash incentives in the education and health domains while only 53% earned a work reward (12). Family Rewards led to a significant increase in household income and a reduction in poverty rates and material hardship (17). These improvements weakened once the cash transfers were no longer available but the positive effect on perceived financial well-being was sustained beyond the end of the program (13). Family Rewards improved graduation rates for 9th graders at study entry and other school outcomes for those who entered high school as proficient readers (12). Parental self-reported employment increased as a result of the program, but it was not confirmed by administrative data from the Unemployment Insurance System (12). Additional details on the program can be found in the 2010 MDRC report, which also includes a qualitative evaluation of the implementation of Family Rewards from the perspective of users and staff (4).

In this paper, we examine further the impact of the program on health care use and health outcomes; and explore potential mechanisms linking the cash transfer to health.

Study Data and Methods

Design

The analysis draws on three rounds of survey data, capturing baseline, in-program and post-program outcomes. Survey data were first collected at baseline for all participants (4,749 families), covering demographic, socioeconomic and health status information prior to study entry. A randomly selected subset of the sample was then interviewed face-to-face at 18 (3,082 families) and 42 months (2,966 families). The 42-month survey was fielded six months after the program ended. Response rates at 18 and 42 months were 84% and 82% for the program group; and 80% and 76% for the control group, respectively. Previous analyses suggest that program and control groups were representative of baseline characteristics, and that there were no systematic differences in response rates or missing data (12, 17).

Outcome measures

Health care use. Respondents were asked whether they and their children had medical coverage (of any type) in the previous month. Preventive health care use was assessed as binary indicators of whether the respondent had seen their personal doctor or health care provider in the past 12 months, had at least two dental visits in the past year, had the emergency room as usual source of care in past year, and whether he/she was treated for any medical condition in the past year. Unmet health care needs measured whether the respondent did not have medical care because of financial constraints in the past year; and whether the respondent did not fill a prescription because of financial constrains in the past year.

Children's health care access was assessed by asking parents whether the child had a routine health care provider and a personal pediatrician. Preventive health care use was measured based on whether the child had a health checkup in the past year and whether he/she had at least two dental visits in the past year. In addition, for children aged under 6, respondents were asked whether the child had a physical examination in the past year, a dental checkup in the past year, and whether he/she was screened for an early intervention program.

Physical health. For adults, self-reported health was measured on a scale, ranging from 1 (poor) to 5 (excellent). Respondents' Body Mass Index was measured based on self-

reported weight and height. Respondents were also asked to report whether they had been diagnosed with asthma, high blood pressure, high cholesterol or diabetes. Respondents were also asked whether they smoked at the time of interview (yes/no).

Physical health measures for children included the child's health as rated by parents (ranging from 1 to 5 with higher values indicating better health); and binary indicators of whether the child had any health condition (physical, mental or learning disability), attention deficit disorder, or asthma.

Hope and mental health. The 'State of Hope' scale is a validated six-item measure of hope (18). It includes two dimensions, measuring agency (goal-directed thinking. i.e. ability to initiate and sustain action) and pathways (planning to accomplish goals) (19). The scale ranges from 6 (low hope) to 24 (high hope). Higher levels of hope are associated with several indicators of positive mental health, while low levels of hope are associated with symptoms of mental illness and depression (20).

At 18 months, respondents were asked if they had experienced a serious psychological distress in the past month and were administered the Kessler Psychological Distress (K10) scale, a validated 10-item measure of psychological distress experienced in the past month (21). Scores range from 10 (no

distress) to 50 (severe distress). The 'State of Hope' scale and the K10 scale were measured among a randomly selected sub-sample of respondents (*N*=2,043).

Perceived material circumstances. A perceived financial wellbeing score was calculated by asking respondents whether they agreed with the following statements: 'your financial situation is better than last year'; 'you don't worry about having enough money in the future'; 'you can generally afford to buy needed things'; 'you sometimes have enough money to buy something or go somewhere just for fun'. The score ranges from 4 to 16 points, with higher scores indicating higher financial wellbeing. The food insufficiency scale assesses whether families have enough to eat in the past month. The scale ranges from 1 (often not enough to eat) to 4 (enough to eat of the kinds of food desired).

Approach

As Family Rewards was evaluated through a Randomized Controlled Trial (RCT), its effects can be identified by comparing outcomes between the program and control groups. The two groups were not significantly different in most pre-random assignment characteristics (4).

We conducted an intent-to-treat analysis to assess the impact of Family Rewards on health care use and health, separately for parents and children. Ordinary Least Squares regressions were estimated to improve precision and eliminate any group imbalances. All models controlled for gender, race/ethnicity and parental level of education, primary parent's marital and employment status, number of children and primary language spoken at home.

We employed an Oaxaca-Blinder decomposition approach to describe the factors which contributed to the impact of Family Rewards on distal health outcomes (22, 23). The method decomposes outcome differences between the program and control groups into two components: (1) a part attributed to differences between the two groups in terms of a number of factors affected by the program; and (2) a part attributed to differential response to characteristics (22). The advantage of this approach is that it reveals the extent to which differences in distal measures might be associated with specific proximal measures. For example, changes in self-reported health in the program group might be explained by changes in preventive health care use or in health insurance coverage. Decomposition analyses used post-treatment follow-up assessments of health insurance coverage, preventive health care use, unmet health care needs, smoking and financial

wellbeing. Further details are provided in **Appendix Exhibit 3** (16).

Limitations

This study has several limitations. First, the decomposition approach is descriptive and not a definitive test of the relative importance of different mechanisms. Second, the integrated nature of the program meant that causal effects can be ascribed to the intervention, but not to specific incentives. Third, although our results have strong internal validity, there are potential limitations to their external validity. For one, participants in the RCT may be more motivated on average than non-participants to change behaviors and report these changes. For another, the intervention targeted low-income families, mainly single-headed, African-American or Latino families, which were representative of their neighborhoods (4) but not necessarily of other neighborhoods, cities, or nations. The in-program and post-program data was collected on a randomly selected subsample, which reduced statistical power. Previous analyses have confirmed that the survey samples provided reliable estimates which can be generalized to the study population (12). A final limitation relates to physical health measures. Outcomes were self-reported and included binary diagnoses of chronic conditions, which may fail to capture impacts on disease

management or prognosis improved by closer contact with health services. Correcting for BMI self-reporting bias did not substantially change our results (see **Appendix Exhibit 4** (16)). Data did not include a clinical examination to measure effects on subclinical outcomes. This evaluation, therefore, offers only a limited window on the potential physical health effects of Family Rewards. In addition, no information is available on important health behaviors such as drinking, nutrition, physical activity or sleep, which could have changed in response to the program.

Study Results

Exhibit 1 displays the demographic, socio-economic and health characteristics of the sample at randomization. Most participating households were headed by a single parent (80.9%), most often a mother (94.6%). Nearly all families were Hispanic (47.1%) or Black (50.5%). Many families were already receiving public assistance at baseline, in the form of food stamps (59.4%), housing assistance (53.3%), and TANF (24%). Just over half of the sample (51.1%) was working at baseline; and only 19.7% of the total sample was working more than 30 hours per week. Only 5.8% of parents and 2.7% of children had no medical insurance coverage in the year preceding the start of the program. Most families had used preventive care services in the past year, in the form of a medical check-up

(81.7% for parents) or dental check-up (64.8% for parents). 19.1% of adult respondents rated their own health as fair or poor. Only 3.5% of children were described by their parents as having fair or poor health. Full results are presented in **Appendix Exhibit 5** (16).

Exhibit 2 shows the effect of Family Rewards on parental outcomes at 18 and 42 months. Full results are presented in **Appendix Exhibit 6** (16). At 18 months, the program led to modest albeit statistically significant increases in the probability that respondents and their dependent children were covered by health insurance (1 percentage point and 1.9 percentage points respectively, $p<0.01$). Participants in the program group also had a significantly higher probability to have seen their personal doctor or health care provider since enrolment or to be treated for any medical condition than the control group – although these effects were small in magnitude (3.9 and 4.2 percentage point difference between the two groups respectively, $p<0.01$). They were also less likely to have used the emergency room as their usual source of care in the past year ($p<0.001$). The largest effect was found for dental visits with an 11.6 percentage point difference between the control and participating group ($p<0.001$). The program also had effects on more distal outcomes. Participants in the treatment group were less likely to forego medical care due to costs in the past year ($p<0.001$), and they scored

significantly higher than those in the control group on the self-rated health scale (p<0.001). The program had no effects on other measures of physical health or on the Kessler Psychological Distress scale at 18 months.

Post program at 42 months, many of the effects observed in program had disappeared. Program participation was still associated with a higher probability of having health insurance coverage (2.2 percentage point difference, p<0.01). The most consistent effect of the program among incentivized behaviors was on dental visits (13 percentage point difference, p<0.001). A small reduction in unmet health care needs persisted. No effect on physical health outcomes was detected at 42 months. However, participants randomized to Family Rewards scored higher on the 'State of Hope' scale by half a point (p<0.001).

Exhibit 3 presents the effects on a range of child health outcomes. Full results are presented in **Appendix Exhibit 7** (16). The only consistent effect was on dental visits, an outcome directly incentivized by the program. Children in the intervention group were more likely to have had a dental check-up in the past year compared to those in the control group (11.8 percentage point difference between the two groups, p<0.001). This effect persisted into the 42-month survey (14.6 percentage point difference, p<0.001). Family

Rewards was not associated with increases in other preventive health care use or with health outcomes in children.

We decomposed observed differences in adult self-rated health at 18 months and state of hope at 42 months, two distal outcomes for which we observed significant improvements. Full results are provided in **Appendix Exhibit 8** (16). Differences between the two groups in factors affected by the program explained to a large extent the gap in these outcomes, accounting for 56% of the gap in average self-rated health at 18 months, and 42% of the difference in average hope score at 42 months. **Exhibit 4** details these contributions. Differences in average self-rated health at 18 months were primarily associated with families in the program group enjoying higher levels of financial wellbeing (67% of the difference) and using more preventive health care services (33% of the difference). Improved financial wellbeing also explained 32% of the gap in 'State of Hope' score at 42 months between the two groups while preventive care use explained 21% of the difference. Other factors such as health insurance coverage did not significantly contribute to health differences between the two groups.

Discussion

The objective of this study was to assess its effects on health care use and health. Several important findings emerge from this experiment. First, the program had modest but meaningful effect on some preventive health services, especially dental care. Second, Family Rewards had a positive impact on parents' perception of their health as well as level of hope, mainly through improvements in reported financial wellbeing. While evidence of effects on physical health is weaker, our study offers a limited window on these outcomes and may not fully capture impacts on chronic disease risk and management that may take longer to accrue.

Under the program, poor households made more use of preventive health services, a key outcome upon which the transfer was conditioned (1). However, the effects remain modest relative to those observed in certain Latin American programs where baseline levels were low and effects sizes many fold higher (8). The exception was dental care, with a difference of 11.6 to 14.6 percentage points as a result of the program. This is an important effect: oral health is one of the largest unmet health care needs in the US, and the single largest among children (24).

Improvements in intermediate outcomes translated into improvements in some distal health outcomes. Adult participants reported better self-rated health, which echoes

findings from Mexico's Oportunidades (10, 25). This positive effect is remarkable as very few social policy interventions in high-income countries have managed to move the needle on self-rated health (e.g. 26, 27). At 42 months, program participants had also higher scores on the 'State of Hope' scale. While not a direct measure of mental health, this finding should not be underestimated: higher levels of hope in adults are associated with higher positive affect, life satisfaction, self-esteem, self-rated physical health, and reduced depressive symptoms (28). Family Rewards' effects on health were mainly linked to improvements in perceived financial wellbeing. Households earned on average $8,674 over the three years of the program. It corresponds to a 22% increase in average monthly income (12, 13, 17), an effect similar to Oportunidades which increased the average income of participating families by 25% (9). Reductions in financial hardships may be a meaningful pathway by which the program exerted an effect.

A key difference between Family Rewards and its Mexican predecessor is its lack of effect on children's health. While children in Oportunidades improved on a range of health outcomes (10, 11), Family Rewards only increased dental visits. Likewise, many measures of adult physical health were left unaffected by the program. These findings have been largely confirmed in Family Rewards 2.0, a replication study

implemented in Memphis and the Bronx after Family Rewards, which added family guidance and fewer rewards to the original design, but found few health effects on children and adults (29). Several factors might explain the mixed effects of Family Rewards. Family Rewards operated alongside a range of long-standing social programs such as the EITC, TANF and Medicaid. This contrasts with lower income countries, where CCTs were introduced in the context of relatively limited social safety nets. A second, related explanation refers to the very high levels of compliance at baseline with behaviors incentivized by the program, such as health insurance coverage and preventive checkups, in part thanks to previous efforts from the City of New York to expand health insurance to low-income families (30). It consequently left limited room for additional take-up. It may also explain the large effects for dental care visits, for which baseline levels were lower than for other measures of preventive care use. Participating families also ended up earning less in rewards than anticipated at the inception of the program (12) and the positive effect on household income did not last once the cash benefits were discontinued. Third, studies in low- and middle-income countries have largely focused on acute outcomes such as birth weight (11). By contrast, our evaluation focused on non-communicable diseases and risk factors. Changes in chronic disease risk may take longer to manifest than changes in acute outcomes, and may consequently not have been captured in the

relatively short-time horizon of our evaluation. Finally, a unique aspect of Family Rewards was to add rewards for parental employment. While 53.2% of households earned a reward in the area of work (17), the program did not produce meaningful improvements in parental employment (12) – a key outcome on which the long-term effects on health and wellbeing had been hypothesized. Weak effects on employment may partly be due to the 2008 economic crisis, which happened in the middle of the program's evaluation, and likely limited participants' opportunities for paid employment. This in turn points to the limitation of imposing conditions which cannot realistically be met.

Policy implications

Our findings contribute to the debate around CCTs (31, 32) by providing experimental evidence of effects on health in the US. Overall, these results offer a contrasted picture. Family Rewards improved subjective health, hope and dental care among poor families, thus contributing to reducing health disparities. However, it had no or limited effects on disparities in a range of other health outcomes. These findings suggest that in high-income countries, CCTs are likely to have smaller effects on health and need to operate alongside other social protection programs to reduce health disparities. While Family Rewards could have a direct effect

on health via increased health care utilization, our results imply that the mechanisms linking CCTs to health are complex and not fully addressed by the program as designed.

Conclusion

Family Rewards led to improvements in subjective health, levels of hope and dental care, but left unaffected other health measures. These findings suggest that CCTs in the US may contribute to reduce health disparities but also point to their limitations in a high-income context. Further experimental evidence is required to explain the relatively small changes in behaviors generated by the program. Future studies should also compare the health benefits of conditional relative to unconditional transfers (33), and examine potential long-term effects on children and families.

Endnotes

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15. To access the Appendix, click on the Appendix link in the box to the right of the article online. The Appendix details the amount and schedule of the cash transfers offered by the program. For example, attending a preventive dental care check-up was rewarded with $100 per family member (once per year for children 1-5 years old; twice per year for family members of 6 years of age or older).
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Exhibit List

EXHIBIT 1. (table)
Caption: Selected sample characteristics at randomization, overall and by assignment status, Opportunity NYC-Family Rewards experiment, 2007-2010
Sources: Data are from Family Rewards baseline survey.
Notes: Percentages may not add up due to rounding. The full table is included as Appendix Exhibit 2 (16).

EXHIBIT 2. (table)
Caption: Effect of the program on parental outcomes at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010
Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys.
Notes: A hyphen indicates that no data were available. Full results are presented in Appendix Exhibit 5 (16). The first two columns of the Exhibit present the adjusted proportion or mean for the control and treated groups. For example, at 42 months, 34.4% of parents in the control group reported having two or more dental visits in the past 12 months, compared with 47.4% of those in the program group. The third column corresponds to the adjusted difference between program and control obtained from a linear regression model. Family Rewards was associated for example with a 13 percentage point difference in the probability of reporting two or more dental visits in the past year compared to a control group who did not receive the intervention. For continuous scales such as the 'State of Hope' scale, program participation was associated with a 0.51-point increase at 42 months compared to the control group. All models controlled for selected baseline characteristics: age, gender, ethnic background, employment status, primary language and level of education. Robust standard errors were clustered at the household level. Statistical significance levels are reported as ***p<0.001; **p<0.01; *p<0.05.

EXHIBIT 3. (table)
Caption: Impact of the program on children outcomes at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010
Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys.
Notes: Full results are presented in Appendix Exhibit 6 (16). The first two columns of the Exhibit present the adjusted proportion or mean for the control and treated groups. For example, at 18 months, 60.5% of children in the control groups reported having two or more dental visits in the past 12

months, compared with 72.3% of those in the program group. The third column corresponds to the adjusted difference between program and control obtained from a linear regression model. Family Rewards was associated for example with an 11.8 percentage point difference in the probability of having had at least two dental visits in the past year compared to a control group who did not receive the intervention. All models control for selected baseline characteristics: age, gender, ethnic background, household primary language and parental level of education. Robust standard errors are clustered at the household level. Statistical significance levels are reported as ***p<0.001; **p<0.01; *p<0.05.

Exhibit 4. (figure)
Caption: Contribution of individual factors to differences between program and control group in self-rated health and scale of hope score, Opportunity NYC-Family Rewards experiment, 2007-2010
Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys.
Notes: The exhibit details the contributions of the listed individual characteristics to the overall difference in self-rated health and hope score. Full results are available in Appendix Exhibit 8 (16). Measures are from the 18-month survey for the self-rated health model and from the 42-month survey for the scale of hope score. The triangle point represents the total contribution of all individual factors to the observed difference in self-rated health and hope score respectively.

EXHIBITS

Exhibit 1. Selected sample characteristics at randomization, overall and by assignment status, Opportunity NYC-Family Rewards experiment, 2007-2010

	Overall	Program	Control
Parents (N=4,749)			
One-parent family (%)	80.9	80.5	81.4
Gender of primary parent (%)			
Female	94.6	94.9	94.2
Race/ethnicity of primary parent (%)			
Hispanic/Latino	47.1	47.3	46.9
Black	50.5	50.7	50.3
Primary parent currently working (%)	51.1	49.9	52.4
Primary parent working more than 30 hours (%)	19.7	19.2	20.3
Health insurance coverage (%)			
Public health insurance	72.6	72.4	72.7
Employer health insurance	18.9	19.4	18.3
Other health insurance	2.8	2.7	2.8
Not covered	5.8	5.4	6.1
Had annual medical check-up when not sick			
Within the past year	81.7	81.9	81.3
Had preventive dental check-up			
Within the past year	64.8	64.9	64.7
Self-rated health (%)			
Excellent or very good	43.5	43.3	43.7
Good	37.4	37.3	37.5
Fair or poor	19.1	19.4	18.9
Children (N=11,331)			
Parent's rating of child's health			
Excellent or very good	74.6	75.7	73.5
Good	21.8	21.1	22.6
Fair or poor	3.5	3.2	3.8

Exhibit 2. Effect of the program on parental outcomes at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (*N*=3,082)			42-month (*N*=2,966)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Preventive health care use and insurance coverage in the last 12 months						
Medical coverage (%)	94.3	95.3	1.0**	93.9	96.1	2.2**
Children insurance coverage (%)	92.8	94.7	1.9**	93.9	95.3	1.4
Seen personal doctor (%)	80.2	84.1	3.9***	95.4	95.5	0.1
2+ dental visits (%)	57.5	69.1	11.6***	34.4	47.4	13.0**
Treated for any condition (%)	41.9	46.1	4.2***	46.8	50.3	3.5
Used emergency room as usual source of care (%)	4.9	3.2	-1.7**	3.7	3.2	-0.5
No medical care because of cost (%)	9.2	6.3	-2.9***	8.1	5.1	-3.0**
No prescription because of cost (%)	14.6	14.2	-0.4	10.9	12.4	1.5
Health outcomes						
Average self-rated health	3.05	3.2	0.15***	3.0	3.1	0.13
Asthma (%)	15.3	17.4	2.1	16.5	16.7	0.2
Average BMI	30.4	30.2	-0.2	30.4	30.1	-0.3
High blood pressure (%)	20.4	21.2	0.8	24.8	26.2	1.4
High cholesterol (%)	8.6	9.7	1.1	10.3	10.7	0.4
Diabetes (%)	7.2	9.1	1.9	9.7	11.9	2.2
Currently smoking (%)	23.3	20.7	-2.6	23.3	20.8	-2.5
Average score on 'State of Hope' scale	17.3	17.5	0.2	17.5	17.9	0.51***

Exhibit 3. Impact of the program on children outcomes at 18 months and 42 months Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (*N*=6,559)			42-month (*N*=6,464)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Preventive health care use and insurance coverage in the last 12 months						
Has routine health care provider (%)	93.6	93.9	0.3	91.2	92.6	1.4
Has personal pediatrician (%)	92.3	92.5	0.2	88.3	87.7	-0.6
Had health check-up (%)	96.6	97.5	0.9	94.0	96.3	2.3
2+ dental visits (%)	60.5	72.3	11.8***	48.3	62.9	14.6***
Physical health						
Average children's health as rated by parents	3.82	3.8	0.05	3.8	3.9	0.1
Has any health condition (%)	28.2	27.2	-0.1	27.5	27.1	-0.4
Has an attention deficit disorder (%)	4.9	3.7	-1.2	3.6	3.1	-0.5
Has asthma (%)	10.8	10.2	-0.6	9.1	9.6	0.48
For children under 6 (in the last 12 months)						
Had physical examination (%)	97.1	97.6	0.6	96.2	99.0	2.8
Had a dental check-up (%)	64.2	73.5	9.3	61.3	63.7	2.4
Was screened for an early intervention program (%)	24.9	33.5	8.6	24.7	30.8	6.1

Appendix Exhibit 1. Amount and schedule of the cash transfers offered by Family Rewards, Opportunity NYC-Family Rewards experiment, 2007-2010

Domain	Amount
Education incentives	
Elementary and middle school students	
Attends 95% of scheduled school days [a]	$25 per month
Scores at proficiency level (or improvement) on annual math and English language arts (ELA) tests	$300 per math test; $300 per ELA test for elementary school students. $350 per math test; $350 per ELA test for middle school students
Parents reviews low-stakes interim test [b]	$25 for parents to download, print and review results (up to 5 times per year)
Parents discussed annual math and ELA test results with teachers [a]	$25 (up to 2 tests per year)
High school students	
Attends 95% of scheduled school days	$50 per month
Accumulates 11 course credits per year	$600
Passes Regents exams	$600 per exam passed (up to 5 exams)
Takes PSAT test	$50 for taking the test (up to 2 times)
Graduates from high school	$400
All grades	
Parent attends parent-teacher conferences	$25 per conference (up to 2 times per year)
Child obtains library card [a]	$50 once during the program
Health incentives	
Maintaining public or private insurance [a]	Per month: $20 (public); $50 (private) for each parent covered Per month: $20 (public); $50 (private) if all children are covered
Annual medical checkup	$200 per family member (once per year)
Doctor-recommended follow-up visit [a]	$100 per family member (once per year)
Early-intervention evaluation for child under 30 months old, if advised by the pediatrician	$200 per child (once per year)
Preventive dental care	$100 per family member (once

(cleaning/checkup)	per year for children 1-5 years old; twice per year for family members of 6 years of age or older)
Workforce incentives	
Sustained full-time employment [c]	$150 per month
Education and training while employed at least 10 hours per week [d]	Amount varied by length of course, up to a maximum of $3,000 over three years

Source: Adapted from Riccio et al, 2010. **Notes:** In an effort to simplify the experiment, reduce its costs and improve its replicability if successful, a number of rewards were eliminated after the first year as noted in the table. The primary parent received the transfers corresponding to all health, work and elementary/middle school related rewards, while high school students, depending on the reward, directly received the entire payment or split half of the value with their parents.

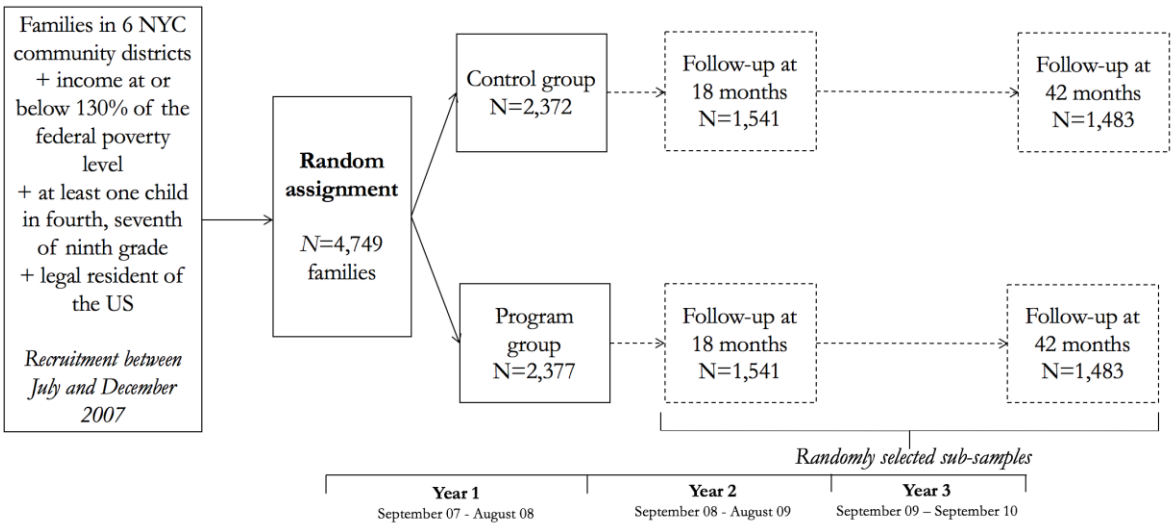
[a] Discontinued after Year 2 of the program.

[b] Discontinued after Year 1 of the program.

[c] Full-time employment is defined as working 30 hours per week.

[d] The employment condition was removed after Year 2 of the program.

Appendix Exhibit 2. Randomization, program and follow-up of participants in Family Rewards, Opportunity NYC-Family Rewards experiment, 2007-2010



Program timeline

Sources: Adapted from Riccio et al, 2010. **Notes:** MDRC identified the target sample based on the eligibility criteria described in the Exhibit and contact information from the NYC Department of Education. Seedco in partnership with Neighborhood Partner Organizations oversaw recruiting the families. MDRC calculated that a sample size of 5,100 families (2,550 per group) would give the study 80% power to detect effects on a range of outcomes, both for the full sample as well as by key demographic characteristics. MDRC implemented the randomization off site in batches using a random assignment algorithm to ensure appropriate randomization for each wave of recruitment. Random assignment was completed in January 2008. Participants were notified of their allocation to the program or control group by letters sent by Seedco (treated group) or MDRC (control group). Families assigned to the program group were then scheduled for a program orientation session. Randomly-selected subgroups were used for the collection of the survey data at 18 and 42 months but administrative data follow-up (not used in this analysis) was available for the full sample of participants.

Appendix Exhibit 3. Technical Appendix, Oaxaca-Blinder decomposition

The Oaxaca-Blinder decomposition is a regression-based model which divides the gap in the outcome of interest between two groups into an 'explained' portion and an 'unexplained' portion. The 'explained' portion of the gap corresponds to the difference in the outcome attributable to group differences in a set of measured predictor variables between the treated and control group. The 'unexplained' portion comes from differentials in how the predictor variables are associated with the outcomes in the control and treated groups. This is accomplished by building an OLS regression equation to obtain slope values (beta) for all variables of interest, and then varying the estimate (X) values of interest.

After adjustment on parental baseline characteristics (gender, race/ethnicity, educational attainment, marital status, employment status, number of children and primary language spoken at home), we considered a range of predictor variables in our models: health insurance coverage (binary indicators of whether the respondent had medical coverage (of any type) in the previous month; and whether all dependent children had medical coverage (of any type) in the previous month); preventive health care use (binary indicators of whether the respondent had a health check-up since enrolment, had at least two dental visits in the past year and whether he/she was treated for any medical condition); unmet health care needs (two binary measures of whether the respondent did not have medical care because of cost in the past year and whether the respondent did not fill a prescription because of cost in the past year); financial wellbeing (financial wellbeing score and food security scale); and health behavior (binary indicator of whether the respondent was currently smoking). These factors were measured at 18 months for the self-rated health model and at 42 months for the state of hope model.

We used the Oaxaca command in Stata 14 (18), with the pooled option to estimate coefficients for the explained portion of the model. We used the program group as the referent group. We also used the detail option of the command to subsume coefficients in larger predictor categories as listed above.

Appendix Exhibit 4. Effect of the program on self-reported and corrected BMI at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (N=3,082)			42-month (N=2,966)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Average BMI	30.4	30.2	-0.2	30.4	30.1	-0.4
Corrected average BMI[a]	31.3	31.2	-0.1	30.7	30.3	-0.4

Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys.

Notes: All models control for selected baseline characteristics: age, gender, ethnic background, household primary language and parental level of education. Robust standard errors are clustered at the household level. Statistical significance levels are reported as ***p<0.001; **p<0.01; *p<0.05.

[a] Corrected BMI is based on NHANES height and weight values corrected for gender- and ethnicity-specific reported bias.

Appendix Exhibit 5. Selected sample characteristics at randomization, overall and by assignment status, Opportunity NYC-Family Rewards experiment, 2007-2010

	Overall	Program	Control
Parents (N=4,749)			
One-parent family (%)	80.90	80.48	81.37
Number of children under 19 (mean, SD)	2.49 (1.29)	2.47 (1.25)	2.50 (1.33)
Primary language spoken is English (%)	77.24	77.46	77
Household earnings above 130% of poverty line (%)	11.85	12.50	11.17
Receiving TANF [a] (%)	24.01	24.81	23.21
Receiving food stamps (%)	59.40	60.80	58.02
Receiving housing assistance [b] (%)	53.35	52.14	54.56
Primary parent			
Gender (%)			
Female	94.57	94.96	94.17
Male	5.43	5.04	5.83
Age (mean, SD)	38.85 (7.97)	38.85 (8.05)	38.85 (7.89)
Race/ethnicity (%)			
Hispanic/Latino	47.13	47.32	46.95
Black	50.53	50.74	50.34
Other	2.32	1.94	4.15
Education level (%)			
GED certificate [c]	11.20	9.95	12.45
High school diploma	20.72	19.66	21.80
Associate's degree/2-year college	8.56	8.75	8.36
4-year college or beyond	7.73	7.89	7.57
None of the above	51.79	53.74	49.82
Currently working (%)	51.14	49.90	52.40
Working more than 30 hours (%)	19.75	19.21	20.28
Average weekly earnings of those currently working [d] (mean, SD)	390.84 (221.25)	395.06 (219.4)	386.61 (223.06)
Health insurance coverage (%)			
Public health insurance	72.6	72.45	72.75
Employer health insurance	18.88	19.40	18.35
Other health insurance	2.77	2.75	2.79
Not covered	5.76	5.40	6.11
Had annual medical check-up when not sick			
Within the past year	81.69	81.98	81.30
1-2 years ago	14.53	14.07	14.99
More than 2 years ago	3.58	3.74	3.42
Never	0.25	0.21	0.29
Had preventive dental check-up			
Within the past year	64.83	64.96	64.70
1-2 years ago	23.50	23.89	23.10
More than 2 years ago	10.93	10.42	11.44
Never	0.74	0.73	0.76
Physical or mental health problem limiting work (%)	21.95	22.76	21.14
Self-rated health (%)			

Excellent or very good	43.46	43.26	43.67
Good	37.40	37.33	37.47
Fair or poor	19.14	19.41	18.86
Children (N=11,331)			
Gender (%)			
Female	49.95	49.86	50.14
Male	50.05	50.24	49.86
Age (mean, SD)	10.64 (4.26)	10.54 (4.3)	10.71 (4.22)
Race/ethnicity (%)			
Hispanic/Latino	46.98	46.97	46.48
Black	49.84	50.05	49.62
Other	3.18	2.53	3.90
Health insurance coverage (%)			
Public health insurance	81.07	81.12	81.03
Employer health insurance	14.51	14.97	14.04
Other health insurance	1.72	1.32	2.08
Not covered	2.70	2.59	2.85
Had annual medical check-up when not sick			
Within the past year	90.75	90.50	91.01
1-2 years ago	8.34	8.47	8.21
More than 2 years ago	0.75	0.80	0.70
Never	0.15	0.23	0.07
Had preventive dental check-up			
Within the past year	74.63	73.85	75.42
1-2 years ago	17.16	18.14	16.17
More than 2 years ago	3.06	2.93	3.19
Never	5.15	5.08	5.21
Physical or mental condition limiting work (%)	13.29	12.92	13.65
Parent's rating of child's health			
Excellent or very good	74.65	75.70	73.50
Good	21.84	21.07	22.62
Fair or poor	3.51	3.24	3.78

Sources: Data are from Family Rewards baseline survey. **Notes:** Percentages may not add up due to rounding.

[a] Temporary Assistance for Needy Families.

[b] This category includes living in public housing and receiving Section 8 rental assistance.

[c] General Education Development.

[d] Earnings from work, in 2007 US dollars.

Appendix Exhibit 6. Effect of the program on parental outcomes at 18 months and 42 months, Opportunity NYC-Family Rewards experiment, 2007-2010

	18-month (*N*=3,082)			42-month (*N*=2,966)		
	Control	Program	Adjusted difference	Control	Program	Adjusted difference
Health insurance coverage						
Medical coverage in previous month (%)	94.3	95.3	1.0** (0.1, 2.1)	93.9	96.1	2.2** (0.3, 4.0)
All dependent children had coverage (%)	92.8	94.7	1.9** (0.3, 2.9)	93.9	95.3	1.4 (-0.8, 3.3)
Preventive health care use						
Seen personal doctor/health care provider in past 12 months (%)	80.2	84.1	3.9*** (2.7, 6.7)	95.4	95.5	0.1 (-1.1, 1.5)
At least two dental visits in the past year (%)	57.5	69.1	11.6*** (8.6, 13.7)	34.4	47.4	13.0** (9.4, 16.0)
Treated for any medical condition (%)	41.9	46.1	4.2*** (0.4, 5.5)	46.8	50.3	3.5 (-0.8, 5.6)
Used emergency room as usual source of care in past year (%)	4.9	3.2	-1.7** (-2.7, -0.7)	3.7	3.2	-0.5 (-1.8, 0.5)
Unmet health care needs						
No medical care because of cost in past 12 months (%)	9.2	6.3	-2.9*** (-4.0, -1.2)	8.1	5.1	-3.0** (-5.4, -0.3)
Did not fill prescription because of cost in past 12 months (%)	14.6	14.2	-0.4 (-2.2, 1.4)	10.9	12.4	1.5 (-1.9, 5.1)
Physical health						
Average self-rated health	3.05	3.2	0.15*** (10.9, 22.5)	3.0	3.1	0.13 (-0.01, 0.2)
Asthma (%)	15.3	17.4	2.1 (-0.1, 3.7)	16.5	16.7	0.2 (-2.8, 2.1)
Average BMI	30.4	30.2	-0.2 (-0.4, 0.2)	30.4	30.1	-0.3 (-1.2, 0.4)
High blood pressure (%)	20.4	21.2	0.8 (-1.7, 2.5)	24.8	26.2	1.4 (-3.8, 5.4)
High cholesterol (%)	8.6	9.7	1.1 (-0.8, 2.1)	10.3	10.7	0.4 (-2.8, 3.5)
Diabetes (%)	7.2	9.1	1.9 (-0.3, 2.8)	9.7	11.9	2.2 (-1.6, 4.9)
Currently smoking (%)	23.3	20.7	-2.6 (-3.1, 2.9)	23.3	20.8	-2.5 (-6.8, 1.9)
Mental health						
Average score on 'State of Hope' scale	17.3	17.5	0.2 (-0.1, 0.5)	17.5	17.9	0.51*** (0.2, 0.8)
Experience of serious psychological	13.6	13.5	-0.1 (-2.6, 1.8)	-	-	-

distress in the past month (%)						
Average score on k10 symptom scale	19.7	19.2	-0.5 (-1.6, 0.2)	-	-	-

Sources: Data are from Family Rewards baseline, 18-month and 42-month surveys. **Notes:** A hyphen indicates that no data were available. All models controlled for selected baseline characteristics: age, gender, ethnic background, employment status, primary language and level of education. Robust standard errors were clustered at the household level. Statistical significance levels are reported as ***p<0.001; **p<0.01; *p<0.05. 95% confidence intervals in parenthesis.